GLOSSARY

C-XXX. The letter C followed by a number, designates a Central and Southern Florida Flood Control Project Canal. For example, C-111 reads as "Canal 111". Some canals also have proper names. For example, C-31 reads as "canal 31", also known as the St. Cloud Canal. C-32G reads as "Canal 32G", in which G represents a specific section of the Canal 32 connecting Alligator Lake to Lake Lizzie.

Culvert#XXX. The word culvert followed by a number designates a Central and Southern Florida Project culvert through one of the levees on the perimeter of Lake Okeechobee. Each culvert connects the lake to an adjacent basin. All are under the operation of the USACE.

G-XXX. The letter G followed by a number, designates a Central and Southern Florida Flood Control Project structure. For example, G-72 reads as "Control Structure 72". G structures were built by the District.

HGS-X. The letters HGS followed by a number refer to the Hurricane Gate Structure. These structures were in the levee around Lake Okeechobee and connected the lake to various canals and basins. All of the structures have been replaced by gated spillways.

L-XXX. The letter L followed by a number, designates a Central and Southern Florida Flood Control Project levee. For example, L-38E reads as "Levee 38 east".

L-DX. The letter L followed by the letter D and a number refers to a Central and Southern Florida Project levee on the perimeter of Lake Okeechobee. For example, L-D9 refers to Levee 9 on the perimeter of the lake.

S-XXX. The letter S followed by a number, designates a Central and Southern Florida Flood Control Project structure. For example, S-26 reads as "Control Structure 26". S structures were built by the U.S. Army Corps of Engineers.

1995 base case. The 1995 (current) base case represents the South Florida Water Management Model's estimation of the hydrology of the model area as it would appear if the current facilities and operational policies had been in place under 1965 through 1995 rainfall conditions (31-year simulation period). The 1995 base case uses 1989 wellfield pumpages, the current (1990) District water shortage policy, and 1988 land use and associated demands. Details are defined in USACE and SFWMD (1998).

2000 base case. A South Florida Water Management Model simulation of conditions and operations that approximately represents the year 2000.

2050 base case. The 2050 (future) base case represents the South Florida Water Management Model's estimation of the hydrology of the model area as it would appear if the current facilities and operational policies had been in place under 1965 through 1995 rainfall conditions (31-year simulation period). The year 2050 base case uses 2015 estimated wellfield pumpages at existing locations, the current (1990) District water shortage policy, and 2050 land use and associated demands based on local Comprehensive Plan projections. It also includes environmental enhancement projects that are expected to be implemented by 2050. Details are defined in USACE and SFWMD (1998).

acre-foot. Unit of volume (generally water) with a base area of one acre and a height of one foot; 43,560 cubic feet; 325,872 gallons.

aquifer. A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield useful quantities of ground water to wells, springs or surface water.

backpumping. The practice of pumping water that is leaving an area as runoff back into a surface water reservoir or recharge area.

borrow canal. In most cases, the material for construction of a levee is obtained by excavation immediately adjacent to the levee. The excavation is termed a "borrow". When the borrow paralleling the levee is continuous and allows for conveyance of water, it is referred to as a "borrow canal". For example, the canal adjacent to L-8 levee is called the L-8 borrow canal. Many borrow canals, such as the L-8 borrow canal, are important features of the Project.

CERP. Comprehensive Everglades Restoration Plan as approved by the Water Resources Development Act of 2000.

control structures. Man-made structures designed to regulate the level and/or flow of water in a canal or from a lake or reservoir (e.g. weirs, dams).

crest elevation. The crest elevation of a structure is the level below which water cannot pass the structure. Where the crest elevation of a structure is used to control water flow, the crest elevation is set to maintain the desired upstream water level.

culvert. A culvert is a closed conduit for conveyance of water. Within the District, culverts may be made of corrugated metal pipe or reinforced concrete. The concrete culvert may be either circular or rectangular in cross section. When it is rectangular, the culvert is usually referred to as a box culvert. The cross-sectional area and length of the culvert determine, and in some cases limit, the amount of flow possible through the culvert for given head water and tailwater conditions. Further control of flow through the culvert may be affected by placing a gate or a riser and stoplogs at the headwater end.

Corps. Generally refers to the U.S. Army, Corps of Engineers, but often specifically refers to the Corps of Engineers District, Jacksonville, Florida.

demand. The quantity of water needed to be withdrawn to fulfill a human, environmental or agricultural need.

District. This refers to the South Florida Water Management District (formerly the Central and South Florida Flood Control District), the agency which operates and maintains the Project.

drainage. Drainage is the amount of removal of groundwater from a basin to maintain optimum groundwater levels. Overdrainage is the lowering of groundwater levels below desired levels. See **water control**.

drainage basin. A drainage basin can be defined as a certain area that due to its topographic characteristics is able to convey the runoff produced by rainfall on it to a final location, commonly known as the outlet of the basin. If rain falls over a large area, some of the runoff from that storm will likely enter one stream, and some of it will enter other streams. It is said that those streams “drain different basins”, or that they are in “different drainage basins.” Thus, a drainage basin of a stream is all the land that contributes runoff to the stream or its tributaries. The boundary between drainage basins is represented by the lines of highest elevation or “divide” in a topographic map, from which water is able to establish two or more flow patterns. Usually a large drainage basin or watershed is divided into basins. This creates more accurate calculations because different factors affecting each basin can be taken into consideration. Also, by subdividing a large area (watershed or basin) into basins, hydrologic results can be obtained at intermediate points of the entire basin, which, in this case, are represented at each subbasin. See **runoff and drainage**.

excess water. Excess water in a basin is water that must be removed from the basin for flood protection or to maintain optimum water levels for agriculture. The excess water may come from rainfall, seepage through levees, or from surface water inflows form adjacent basins.

flood control. Flood control is the removal of surface water from a basin to prevent or minimized flood damages.

gated spillway or culvert. A spillway or culvert is "gated" when water flow through the structure is controlled by a gate. Within the Project, almost all gates open upward to allow flow beneath the gate.

General Design Memorandum (GDM). This is a document prepared by the U.S. Army Corps of Engineers that reports all work done prior to preparation of the final design of a project. In the GDM for the Central and Southern Florida Flood Control Project four important aspects of the Project are developed: (1) each of the surface water management basins is delineated, (2) a set of design storms is specified for each basin and the resulting basin discharges are estimated, (3) the flood protection to be afforded each basin is specified, and (4) the size, number and general location of canals and structures needed to achieve the desired level of flood protection are determined. The final design of the canals and structures is given in the **Detail Design Memorandum (DDM)**.

ground water or groundwater. All water found beneath the surface of the earth in the voids, fractures, and pores or other openings of soil and rock material.

irrigation. The application of water to crops by artificial means. The reasons for irrigating may include, but are not limited to, supplying evapotranspiration needs, leaching of salts, and environmental control.

levee. An embankment to prevent flooding, or a continuous dike or ridge for confining areas of land for irrigation by surface flooding.

Natural System Model (NSM). A two dimensional, integrated surface and ground water model used to estimate the hydrology of the Everglades prior to the influence of man. The NSM performs, on a daily basis, a continuous simulation for 31 years (1965-1995) of historic rainfall data.

NGVD. National Geodetic Vertical Datum; reference sea level 1929, from which elevations are measured.

Pre-CERP Baseline. From the CERP Programmatic Regulations, this is defined as "…the hydrologic conditions in the South Florida ecosystem on the date of enactment of WRDA 2000, as modeled by using a multi-year period of record based on assumptions such as land use, population, water demand, water quality, and assumed operations of the Central and Southern Florida Project."

Project. This refers to the Central and Southern Florida Project for Flood Control and Other Purposes. The Project was responsible for the construction of most of the major canals and structures in South Florida.

regulation schedule. A regulation schedule specifies the outlet operational strategy for a reservoir (e.g., Lake Okeechobee) as a function of the water level in the reservoir and the time of year. In general, a regulation schedule optimizes the reservoir's ability to receive excess water in the wet season and to provide water supply in the dry season.

regulatory release. A regulatory release is water discharged from a reservoir to lower the water level in the reservoir in accordance with its regulation schedule.

reservoir. A man-made or natural lake where water is stored.

riser and stoplogs. Riser and stoplogs refer to a means of regulating the water level upstream of a culvert or weir. Stoplogs are individual beams, of fixed dimension, set one upon the other to form a bulkhead supported by channels or grooves (i.e., the riser) at either end of the span. The stoplogs slide in or out of the riser, the number of stoplogs determines the crest elevation of the bulkhead. The structure may be effectively closed by addition of enough stoplogs. The riser is located at the headwater end of the culvert or on top of the weir.

runoff and drainage. All water moving in the landlocked portion of the hydrological cycle is derived either directly or indirectly from precipitation, also known as rainfall. Several things happen to rain after it falls to earth. At the beginning of a rainfall event, part of it forms surface retention. Surface retention consists mainly of two hydrologic processes: interception and depression storage. Interception is that portion of rainfall that is captured by vegetative cover. Rainfall not intercepted continues its downward movement and fills up surface puddles to form depression storage. These components are commonly referred to as initial abstractions. After this, most of the water reaching the ground surface will infiltrate through the soil. As the soil becomes saturated, infiltration rate will decrease, and at the same time, evapotranspiration begins. The process of evapotranspiration (ET) consists of evaporation and transpiration. Evaporation is defined, in this case, as the process by which water is changed into a gaseous state and returned to the atmosphere. Transpiration is the process by which water vapor escapes from a living plant, principally the leaves, and enters the atmosphere. In field conditions, it is practically impossible to differentiate between evaporation and transpiration if the ground surface is covered by vegetation. The two processes are commonly linked together and referred to as evapotranspiration.

Once infiltrating water has passed through the surface layers, it percolates downward under the influence of gravity until it reaches the saturation zone at the phreatic surface or “water table”. This zone is also known as groundwater. Many soils in South Florida are sandy and underlying rock strata. Flow of water is easily accomplished through these permeable soils. When the water table level is higher than the local surface water levels, water will enter the surface water from groundwater. When the water table is lower than the local surface water level, flow is from surface water to groundwater. Usually groundwater supplements stream flow during periods of low rainfall, and surface water recharges groundwater storage during periods of high rainfall.

In general, part of the storm rainfall retained on or above the ground surface is surface retention, which, with the infiltration and evapotranspiration losses, are subtracted from input rainfall resulting in the rainfall excess. This “effective” part of the original rainfall is the one capable of yielding surface runoff after routing to the basin outlet.

The term “drainage” is used to refer to the total surface and subsurface flows entering a lake and/or canal, or a creek from their drainage basin. It is important to keep in mind that during a rain event (especially one severe enough to cause flooding), it is surface runoff that is the important contributor to this flow, and, at times, between rain events, subsurface flow from groundwater to surface water is most important.

Runoff from a drainage area is a function of several factors: how much rain has fallen and how often it has occurred, the depth to the water table, and how the land in the drainage area is utilized. The amount of recent rain, and the depth to the water table impose how much water there is in the soil. The degree to which the soil is saturated, in turn, determines how much of the falling rain may infiltrate the soil, and correspondingly, how much of the rain will runoff to local streams.

Land use has a large influence on the amount of surface runoff entering local streams, which will convey the water to the lakes, canals or creeks. Much of the surface area in an urban development (i.e., roofs, roads, and parking lots) is considered impervious to water. Almost all the rain falling on impervious areas become surface runoff. Some water may be detained and will evaporate, but the percentage of rainfall that enters local stream by surface runoff in an urban development is usually high. As a result, urban developments are subject to high stream flows during rain events, and consequently they need to be provided with drainage systems to avoid or minimize flooding damage.

A vegetated area can intercept and retain a significant part of the rainfall and, consequently, surface runoff will diminish. This intercepted water has an additional opportunity to evaporate or seep into the ground. Commonly, a small percentage of the rain falling on a vegetated area will enter local streams, and consequently will produce runoff. For this reason, stream flows in vegetated areas are moderated compared to urban developments.

saltwater intrusion. In coastal areas of South Florida, fresh and salt groundwaters meet. The fresh groundwater is less dense than the salt groundwater. It floats on, but does not mix with the saltwater. It is necessary to maintain the water table in coastal areas high enough to prevent saltwater from entering the local groundwater and contaminating any nearby wellfields.

spillway. A spillway is a means of passing water from one location to another (e.g., from a lake to a canal or from one part of a canal to another). The purpose of the spillway is to control the flow of water. Control may be affected by gates or by the crest elevation of the spillway or both. Control by gate operation allows variable control of water flow and may control either amount of flow or the upstream water level. Control by the crest elevation is usually not variable and controls only the upstream water level. When water control is strictly by the crest elevation of the spillway, the spillway is usually referred to as a weir.

stage. The elevation of water surface in a water body with respect to a specified datum, usually the National Geodetic Vertical Datum (NGVD) of 1929.

surface water. Water upon the surface of the earth, whether contained in an area created naturally or artificially or diffused.

water control. Water control is the regulation of groundwater levels (i.e., by the regulation of canal water levels) at all seasons and the conservation of water during the dry season. During wet periods, water must be removed from basins to maintain desired groundwater levels. This is sometimes referred to as drainage and is differentiated from flood control which generally refers to removal of surface water from a basin. During dry periods, outflows from the basin are restricted to retain water in the basins to prevent "overdrainage" (i.e. lowering of groundwater levels). In agricultural areas, overdrainage can lead to crop yield reduction or failure, and in coastal areas, to saltwater intrusion to ground water. In some cases, water must be supplied to the basin to maintain groundwater levels.

water control structures. Water control structures are devices, e.g., weirs, spillways, and culverts, placed in or between canals to regulate water levels (stage divide), amount of flow, or direction of flow (flow divide) in the canals. A structure may have more than one function. A divide structure is usually located at or near a basin boundary. When it is closed, it prevents water in one basin from entering the other basin. A water supply structure is usually located near a basin boundary. It is used to pass water from one canal to another, i.e., from one basin to another. A divide structure also often serves as a water supply structure.

Water Conservation Areas (WCAs). That part of the original Everglades ecosystem that is now diked and hydrologically controlled by man for flood control and water supply purposes.

These are located in the western portions of Dade, Broward and Palm Beach counties, and contain a total of 1,337 square miles, or about 50 percent of the original Everglades.

Water Supply Plans. Regional water resource and demand analyses generated by the District to provide a detailed evaluation of available water supply and projected demands through the year 2010.

water surface elevation. A water surface elevation in a canal or a lake is the vertical distance from the surface of the water to some reference elevation or "datum." The GDM reports from the USACE use the elevations relative to the mean sea level (MSL). In the District, elevations are relative to the National Geodetic Vertical Datum (NGVD) of 1929. For practical purposes MSL coincides with NGVD. Water surface elevations may also be referred to as "stages."

Important water surface elevations for a control structure are the headwater (upstream) stage, and the tailwater (downstream) stage (see **water control structures**). The difference between these stages will affect the flow through or over the structure. In general, flow increases as the difference in elevation increases.

Water surface elevations elsewhere in the canal reach are also important. Obviously, if the stage exceeds the top elevation of the canal, flooding will occur. Not as obvious is the fact that the stage in the canal can heavily influence the water table elevations of local groundwater (see **runoff and drainage**). The stages in the lower reaches (near the ocean) of some coastal canals are maintained at levels high enough to prevent intrusions of saltwater into the local groundwater. In other areas, stages are maintained that keep water table elevations low enough to prevent drainage problems in low lying areas.

The headwater side of a gravity flow structure, e.g., ungated spillway, is the side on which the stage is usually higher. It is possible at some structures for the tailwater to occasionally be higher than the headwater stage. The headwater stage at a pumping station, on the other hand, is usually defined as the side from which water is pumped and usually refers to the side with the lower stage. This convention allows the direction of water flow to be consistently defined as from headwater to tailwater side of any structure.

Water elevations or stages in a reservoir, such as Lake Okeechobee, are of crucial importance. These stages are regulated by means of control structures strategically located at the outlets of reservoir. On any given day of the year, if they exceed the value prescribed by the regulation schedule, releases (regulatory or flood control discharges) are made from the reservoir to bring the stages down below the schedule.

weir. See **spillway**.